Revolution Labs

Garage & Internal Illuminance Narratives

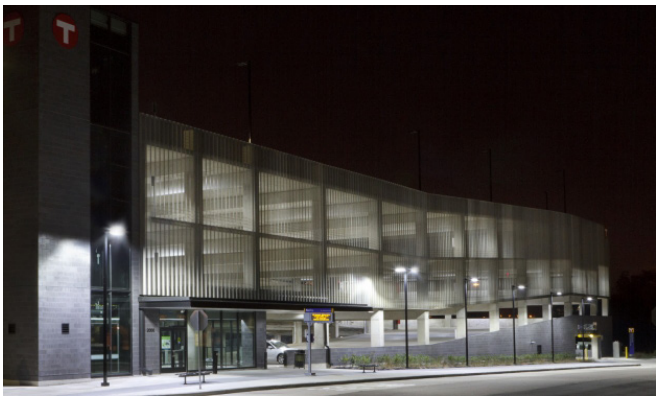
- Garage
- Internal Illuminance

233 Lewis Wharf, Boston, MA 02110 P: 617.229.5190 F: 617.723.5190

GARAGE

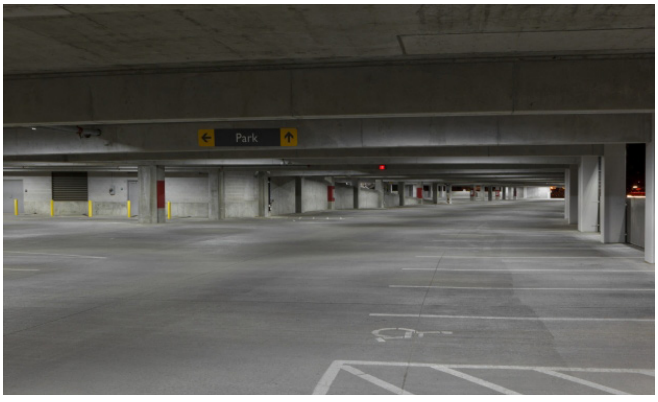
GARAGE LIGHTING APPROACH

The lighting approach for the parking garage at 1050 Waltham Street will meet best practices regarding light pollution reduction, visual comfort, illuminance levels appropriate to the surrounding neighborhood, uniformity, controls intelligence, and sustainability. Lighting strategies are being considered to not only avoid light trespass and glare to the surrounding neighborhood, but also to ensure that the light levels have been designed to the lowest light levels possible while still achieving IESNA recommended minimums for safety and comfort. Care will be taken to not over-illuminate the garage, which could result in complaints from surrounding neighbors, a lack of visual cohesion with the streetscape, and unwanted sky glow. Extra care will be taken to the lighting strategy for the top floor of the garage, which is the most susceptible to creating glare issues and sky glow.



Luminaire optics which not only deliver excellent uniformity but also optimal glare control are critical. By utilizing LED luminaires which incorporate wave guide and glare control technology, and by spacing fixtures at an optimal spacing, the garage can be will lit, uniform, visually comfortable and safe, while at the same time avoiding any negative impacts on the surrounding community.

The controls strategy will allow the lighting system to adjust illuminance levels appropriately throughout the day, evening, and late night. During the day, it's important to increase illuminance levels to compensate for the surrounding daylight, especially at entrances, to help support visual adaptation. Entrances are typically illuminated to 50 fc during daytime hours to support transitions. In the evening, garage illuminance levels should automatically reduce to a lower level (2-3 fc) when unoccupied to support the neighborhood context, helping the garage visually blend into the surrounding area, and simultaneously saving energy, while still allowing cars and pedestrians to easily navigate to and from the garage through clear wayfinding techniques. As motion is detected, the control system can automatically adjust the luminaires to a higher yet comfortable illuminance that is appropriate and meets IESNA standards (5-10 fc). Additional care will be taken at stairwells to ensure both visual comfort and a feeling of safety.



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INTERNAL ILLUMINANCE

APPROACH TO MINIMIZING IMPACTS OF INTERNAL LIGHTING ON THE SURROUNDING NEIGHBORHOOD

Revolution Labs, a new core & shell lab/office building planned for 1050 Waltham Street, is being carefully designed with the Town of Lexington's Zoning Bylaws in consideration. The design and development team is aware of the expected commitment to minimize the impact of internal building lighting on neighboring residential uses and is taking the following approaches to ensuring compliance.

CORE & SHELL LIGHTING APPROACH

The design team will follow best practices when designing and specifying luminaires for all interior core & shell spaces. Illuminance levels will be designed to comply with IESNA recommendations and will not be overlit. In addition, WELL Building standards regarding maximum lens brightness shall be adhered to in order to increase visual comfort and reduce any risk of glare to neighboring residents. Internal luminaires which are adjustable in nature shall not be aimed in a way to be a source of glare when viewed through glazing by neighboring residents. Finally, all interior lighting visible through glazing shall be controlled on a dimmer in order to allow for fine tuning and future adjustments of illuminance levels to ensure surrounding neighborhood resident comfort as needed. Specifications of all luminaires shall be provided to the Planning Board for review and comment with regard to minimizing impact concerns.

TENANT FITOUT LIGHTING APPROACH

Future tenants shall be held to the same standards that are outlined in the Core & Shell Lighting Approach above. The developer and/or building management company shall ensure that future tenants are provided with the impact minimization standards for incorporation of appropriate techniques into future tenant fitout designs.

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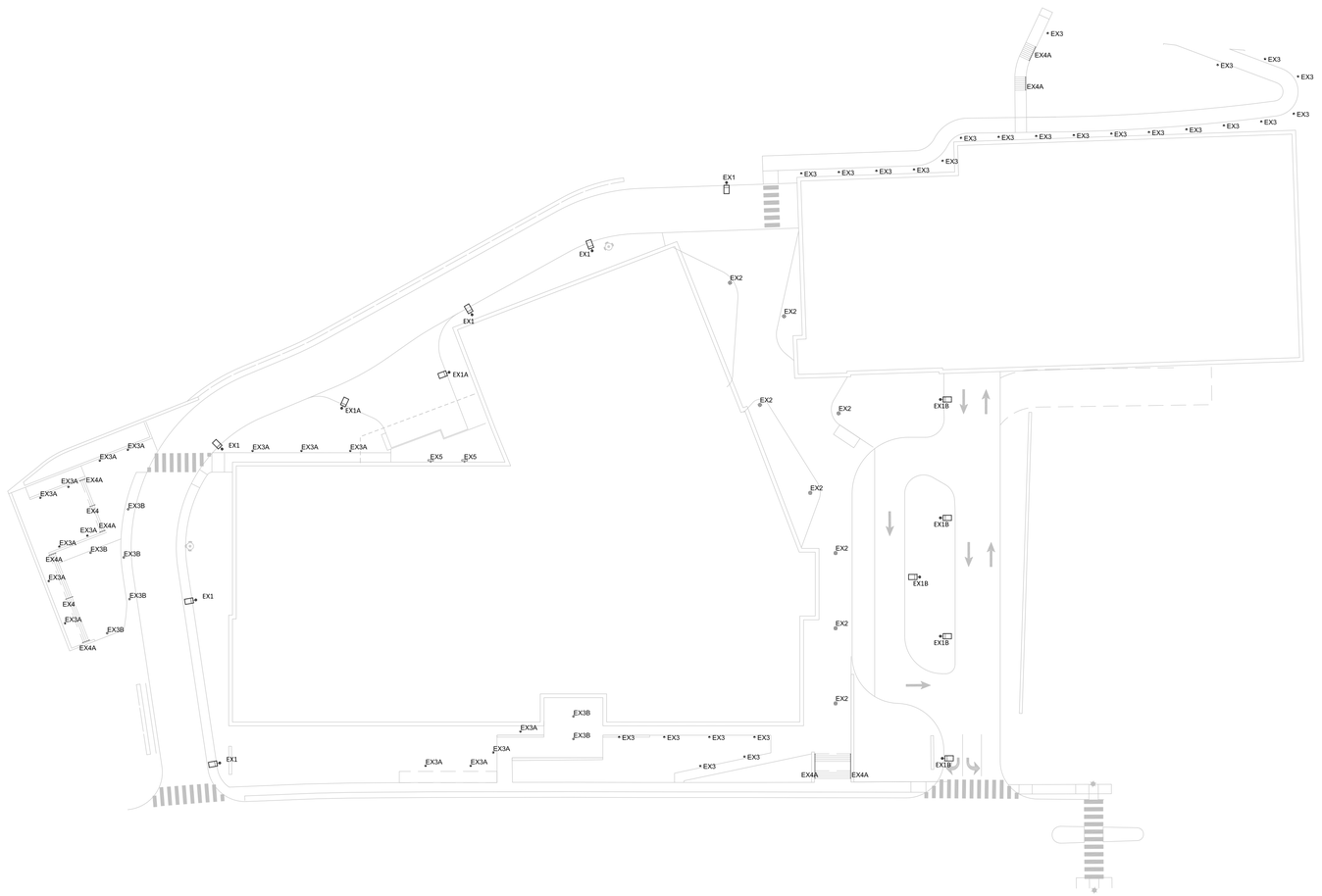
REVOLUTION LABS

Lexington, MA



NOT FOR CONSTRUCTION

NO.	ISSUE DATE	REVIEWED BY	REVISION

PROJECT NAME
Revolution Labs

TITLE
Site Lighting Plan

PROJECT NUMBER
20108.00

SCALE
1/32" = 1' - 0"

DATE ISSUED
15 July 2020

LP-1

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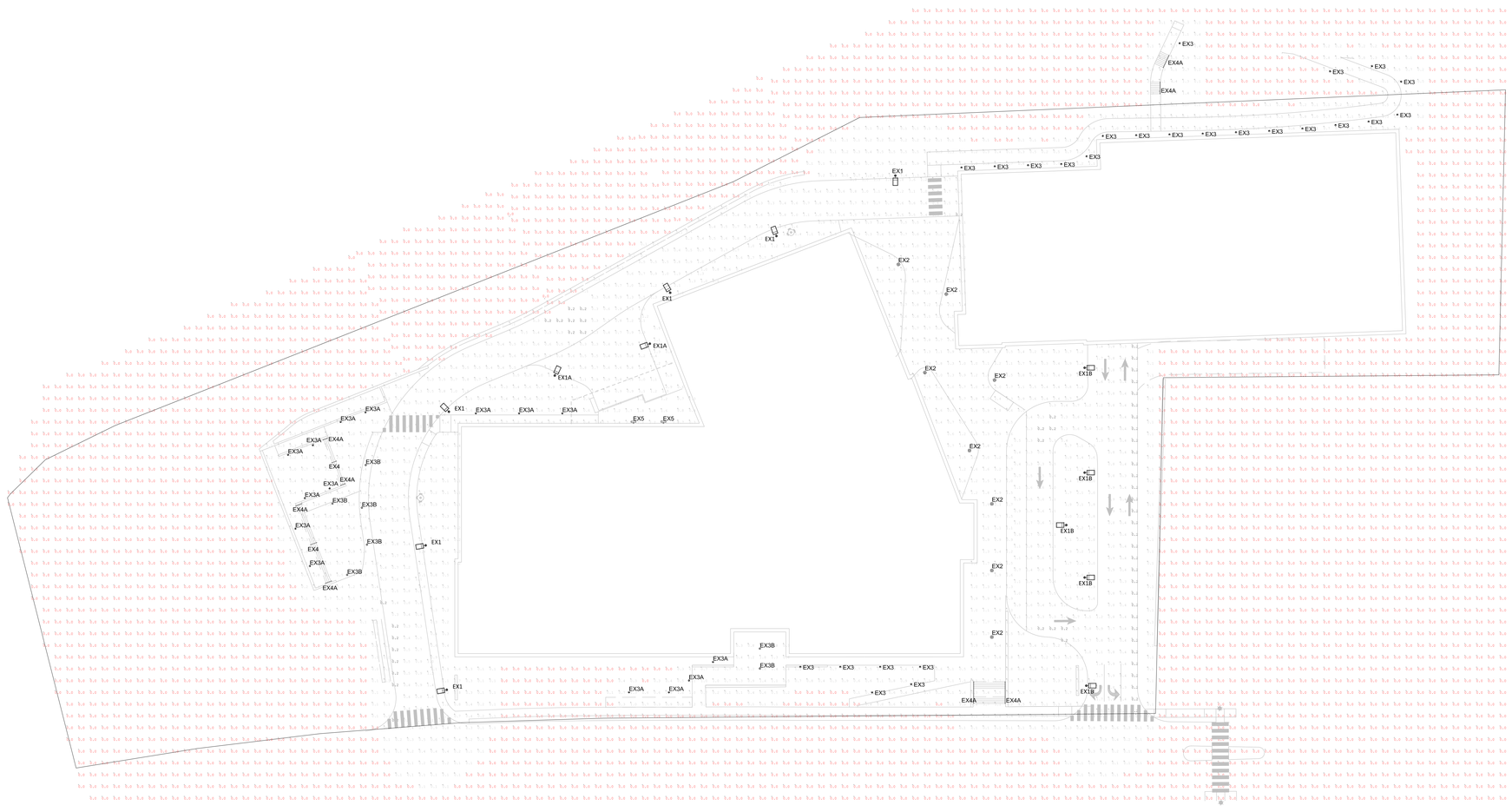


Luminaire Schedule					
Tag	Symbol	Label	Total Watts	Total Lamp Lumens	Total LLF
EX1		Bega "77939 Pole Top" - MH 16FT	23.6 W	3195 lm	0.8
EX1A		Bega "77939 Pole Top" - MH 18FT	23.6 W	3195 lm	0.8
EX1B		Bega "77939 Pole Top" - MH 14FT	23.6 W	3195 lm	0.8
EX2		Bega "84065" - Lighting Column	39.5 W	2508 lm	0.8
EX3		Bega "99853 + 99614" - MH 1.75FT, 180° Optic	6 W	335 lm	0.8
EX3A		Bega "99853 + 99620" - MH 2.75FT, 180° Optic	6 W	335 lm	0.8
EX3B		Bega "99852 + 99620" - MH 2.75FT, 360° Optic	6 W	664 lm	0.8
EX04		Intense "IVR15-RPS" - 60° Symmetric	4.6 W/FT	202 lm/FT	0.8
EX04A		Intense "IVR15-RPS" - 30° Asymmetrical	4.6 W/FT	202 lm/FT	0.8
EX05		Bega "24374" - Sconce	12.3 W	1078 lm	0.8

Required Light Levels IES-RP8
0.2 fc - Min 0.5 fc - Av 4.0 fc - Av/Min

Lighting Calculation Results	
Driveway North/East 0.2 fc - Min 0.71 fc - Av 3.55 fc - Av/Min	Driveway South 0.2 fc - Min 0.61 fc - Av 3.05 fc - Av/Min

Calculation Plane: Ground

Illuminance Calculations Disclaimer:

Illuminance or luminance calculations are for lighting design aid purposes only. All calculations performed by Horton Lees Brogden Lighting Design have been based on IESNA standards, lighting manufacturers' data and good practice. Some differences between measured values and calculated results may occur due to tolerances in calculation methods, testing procedures, component performance, measurement techniques and field conditions such as voltage and temperature variations. Input data used to generate the calculations such as room dimensions, reflectances, furniture and architectural elements significantly affect the lighting calculations. If the real environment conditions do not match the input data, differences will occur between measured values and calculated values.

REVOLUTION LABS

Lexington, MA

NOT FOR CONSTRUCTION

NO.	ISSUE DATE	REVIEWED BY	REVISION

PROJECT NAME
Revolution Lab

TITLE
Photometric Report

PROJECT NUMBER
20108.00

SCALE
1/32" = 1' - 0"

DATE ISSUED
15 July 2020

Luminaire Schedule

GENERAL NOTES:
- Provide luminaire shop drawings for Lighting Consultant, Architect, and Owner approval prior to fabrication. For all continuous run luminaires, including track, manufacturer shall submit a layout drawing for run lengths specified on architectural drawings during submittal review for Lighting Designer and Architect approval prior to fabrication.
- Architect shall verify all luminaire body, trim, flange, pole, track and any other visible accessories/hardware finishes. All visible conduit, junction boxes, canopy plates, hardware, gear containers, etc. shall be painted to match adjacent surfaces (Architect to verify).
- Refer to electrical drawings for voltage information. Electrical contractor shall verify all voltages with Electrical Engineer before placing any orders or proceeding with any work.
- Electrical contractor shall verify emergency operation of all luminaires with Electrical Engineer before placing any orders or proceeding with any work. Refer to electrical drawings for all emergency or code-related requirements.
- Contractor shall verify and coordinate recessed luminaire installation and mounting with architectural details, housing type, field conditions, and ceiling system details including grid type and flange requirements such that there are no light leaks between luminaire and ceiling system and luminaire can accommodate ceiling thickness.
- Contractor to verify and coordinate all other luminaire installation and mounting with architectural details and field conditions.
- Contractor shall verify mounting details with architect and/or architectural drawings and order all mounting components necessary for installation of luminaire at no additional cost, even if such components are not specifically called for in the contract documents.
- Provide adequate and sturdy support for each luminaire. Contractor shall be responsible for verifying weight and mounting method of all luminaires and furnish and install suitable supports. Luminaire mounting assemblies shall comply with all local seismic codes and regulations.
- Provide all luminaires as shown complete with all light sources, completely wired, controlled and securely attached to supports.
- Where both narrative and/or pictorial luminaire descriptions are provided, the written description shall take precedence and prevail. Contractor to confirm via RFI process with lighting designer and architect.
- Locations of luminaires are shown diagrammatically. Verify exact location and spacing with architectural drawings and designer at the site during installation. Notify Owner about field conditions at variance with Contract Documents before commencing installation.
- At the completion of construction, clean lenses and reflectors of all luminaires so as to render them free of any material, substance or film foreign to the luminaire. Blemished, damaged, or unsatisfactory luminaires shall be replaced in a satisfactory manner.

- When applicable, contractor shall review existing circuiting, verify new loads and panel capacity. Contractor shall notify Owner if a conflict between design documents and field conditions occur.
- Contractor shall refer to electrical drawings for information on controls and dimming requirements, and coordinate luminaire and control accessories required for a fully functioning system.
- Contractor to provide line item pricing at bid phase or earlier as requested by lighting designer or architect per type with labor and installation shown as separate line items.
- All 0-10V dimming gear provided shall be isolated to avoid AC interface on the dimming line.
- All LED sources within the same luminaire Type shall be within two (2) MacAdam ellipses/steps of each other.
- For all adjustable luminaires provide labor and materials for final aiming and locking of all adjustable luminaires under the Architect's supervision. Aiming shall take place immediately before building is turned over to Owner, after regular working hours where required. Contractor shall coordinate necessary personnel and equipment
- All luminaires shall have a minimum 3-year warranty.
- All lighting systems shall be ordered with necessary gear, power feeds and mounting accessories as required for installation of a complete system.
- Locate remote gear in a secure, concealed, accessible and well-ventilated location in compliance with manufacturer's directions.
- All luminaires and workmanship shall be guaranteed free of defects and fully operational for a minimum of one year after the acceptance of the project by the Owner unless otherwise indicated in the specifications. Any luminaires or workmanship found to be defective during the warranty period shall either be fixed or replaced by the Contractor at no cost to the Owner.
- The luminaires and workmanship must be in accordance with and meet the standards and regulations of the following: Underwriters Laboratories, National Electric Code, & Local Building and Life Safety Code Agencies.
- Replace all burned-out or inoperative sources and gear in all luminaires before the building is accepted by the Owner so that all luminaires will be in first class operating condition.
- For pendant mounted luminaires provide adequate cord length to suspend luminaires at heights shown on architectural drawings or indicated in the lighting fixture schedule.
- Electrical contractor shall field-verify each run length of continuous fixtures prior to ordering.
- Provide luminaire samples per type as requested in the Fixture Schedule. Supply a completely operable luminaire with cord and plug for standard 120 Volt service.
- Code required accessories and controls such as but not limited to motion sensors, photocell controls, dimming controls, etc. to be specified and coordinated by Electrical Engineer.

TYPE	APPLICATION IMAGE	LOCATION	DESCRIPTION	LAMPS/SOURCE	POWER SUPPLY/ DRIVER	INPUT WATTS	INPUT WATT UNITS	LISTING	MANUFACTURER	NOTES
EXTERIOR LUMINAIRES										
EX1		DRIVEWAYS	Fixture: Pole top 23-7/8" long x 11-1/2" wide LED street light with Type II distribution. Pole: Nominal 16'-0" tall, round steel pole	LED 3000K 80+ CRI 3195 Delivered Lumens	Integral Driver DIM 0-10V	23.6W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "77939" Pole Top #77939-K3-FINISH (Fixture) + 16'-0" tall round steel pole	1. Provide 16'-0" tall aluminum round pole sized to meet local AASHTO requirements for EPA of fixture configuration. 2. Architect shall verify fixture and pole finishes. 3. Fixture shall dim. 4. Fixture shall be U.L. listed and labeled "suitable for wet locations". 5. Adequate drainage must be provided in concrete foundation for pole and pole base. 6. Fixture shall have a minimum 5-year warranty.
EX1A		DRIVEWAYS	Fixture: Pole top 23-7/8" long x 11-1/2" wide LED street light with Type II distribution. Pole: Nominal 18'-0" tall, round steel pole	LED 3000K 80+ CRI 3195 Delivered Lumens	Integral Driver DIM 0-10V	23.6W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "77939" Pole Top #77939-K3-FINISH (Fixture) + 18'-0" tall round steel pole	1. Provide 16'-0" tall aluminum round pole sized to meet local AASHTO requirements for EPA of fixture configuration. 2. Architect shall verify fixture and pole finishes. 3. Fixture shall dim. 4. Fixture shall be U.L. listed and labeled "suitable for wet locations". 5. Adequate drainage must be provided in concrete foundation for pole and pole base. 6. Fixture shall have a minimum 5-year warranty.
EX1B		DRIVEWAYS	Fixture: Pole top 23-7/8" long x 11-1/2" wide LED street light with Type II distribution. Pole: Nominal 14'-0" tall, round steel pole	LED 3000K 80+ CRI 3196 Delivered Lumens	Integral Driver DIM 0-10V	24.6W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "77939" Pole Top #77939-K3-FINISH (Fixture) + 14'-0" tall round steel pole	1. Provide 16'-0" tall aluminum round pole sized to meet local AASHTO requirements for EPA of fixture configuration. 2. Architect shall verify fixture and pole finishes. 3. Fixture shall dim. 4. Fixture shall be U.L. listed and labeled "suitable for wet locations". 5. Adequate drainage must be provided in concrete foundation for pole and pole base. 6. Fixture shall have a minimum 5-year warranty.

TYPE	APPLICATION IMAGE	LOCATION	DESCRIPTION	LAMPS/SOURCE	POWER SUPPLY/ DRIVER	INPUT WATTS	INPUT WATT UNITS	LISTING	MANUFACTURER	NOTES
EX2		WOONERF	8-5/8" x 8-5/8" x 14'-9" tall LED lighting column with symmetric light distribution.	LED 3000K 80+ CRI L70 @ 238,000 Hours 2508 Delivered Lumens	Integral Driver DIM 0-10V	39.5W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "84065" Lighting Column #84065-K3-FINISH (Fixture) + 79801 (Anchorage)	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Adequate drainage must be provided in concrete foundation for pole and pole base. 5. Fixture shall have a minimum 5-year warranty.
EX3		PATHWAYS	5-1/2" diameter x 14-1/4" tall LED bollard with shielded 180º light distribution.	LED 3000K 90+ CRI 335 Delivered Lumens	Integral Driver DIM 0-10V	6.0W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "99853" Bollard - 180º #99853-K3-FINISH (Fixture) + 99614-FINISH (Bollard Tube) + 79824 (Anchorage Unit)	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Refer to base and anchorage detail by Architect / Civil Engineer.
EX3A		PATHWAYS	5-1/2" diameter x 26" tall LED bollard with shielded 180º light distribution.	LED 3000K 90+ CRI 335 Delivered Lumens	Integral Driver DIM 0-10V	6.0W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "99853" Bollard - 180º #99853-K3-FINISH (Fixture) + 99620-FINISH (Bollard Tube) + 79824 (Anchorage Unit)	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Refer to base and anchorage detail by Architect / Civil Engineer.
EX3B		PATHWAYS	5-1/2" diameter x 26" tall LED bollard with shielded 360º light distribution.	LED 3000K 90+ CRI 664 Delivered Lumens	Integral Driver DIM 0-10V	6.0W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "99852" Bollard - 360º #99852-K3-FINISH (Fixture) + 99620-FINISH (Bollard Tube) + 79824 (Anchorage Unit)	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Refer to base and anchorage detail by Architect / Civil Engineer.
EX4		THROUGHOUT	1-1/2" diameter LED illuminated aluminium handrail with 60º flood symmetric light distribution.	LED 3000K 85 CRI L70 @ 50,000 Hours 202 Nominal Lumens per Foot	Remote Driver DIM 0-10V	4.6W	LFT	UL Listed for Dry/Damp/Wet Locations	INTENSE LIGHTING "IVR15-RPS" #IVR15-RPS-FINISH-P-HEIGHT-HO-30-60S	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Luminaire shall be ordered with necessary gear, control interfaces, power feed cables/terminators and mounting accessories as required for a complete system. 5. Locate remote gear in a secure, concealed, accessible and well ventilated location incompliance with manufacturer's directions. Contractor/Manufacturer to coordinate remote gear size, location and wire gauge for <2% Voltage drop over entire length of run.
EX4A		THROUGHOUT	1-1/2" diameter LED illuminated aluminium handrail with 30º asymmetrical light distribution.	LED 3000K 85 CRI L70 @ 50,000 Hours 202 Nominal Lumens per Foot	Remote Driver DIM 0-10V	4.6W	LFT	UL Listed for Dry/Damp/Wet Locations	INTENSE LIGHTING "IVR15-RPS" #IVR15-RPS-FINISH-P-HEIGHT-HO-30-30AS	1. Architect shall verify fixture and pole finishes. 2. Fixture shall dim. 3. Fixture shall be U.L. listed and labeled "suitable for wet locations". 4. Luminaire shall be ordered with necessary gear, control interfaces, power feed cables/terminators and mounting accessories as required for a complete system. 5. Locate remote gear in a secure, concealed, accessible and well ventilated location incompliance with manufacturer's directions. Contractor/Manufacturer to coordinate remote gear size, location and wire gauge for <2% Voltage drop over entire length of run.
EX5		LOADING-UNLOADING ENTRY	11-7/8" long x 4-3/8" tall x 3-3/8" deep direct LED wall sconce for wet locations (IP64).	LED 3000K 80+ CRI L70 @ 108,000 Hours 1077 Delivered Lumens	Integral Driver DIM 0-10V	12.3W	EA	UL Listed for Dry/Damp/Wet Locations	BEGA "24374" Wall Sconce #24374-K3-FINISH	1. Fixture shall dim. 2. Fixture shall be listed and labled "suitable for wet locations"

Pole top luminaires with asymmetric flat beam

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Housing/fitter: One piece heavy die-cast aluminum construction with swivel arm and internal full semi specular anodized aluminum reflectors. Swivel arm allows for 0° to 15° aiming positions. Integral fitter slip fits 3" O.D. pole top and is secured by eight (8) socket head stainless steel set screws threaded into stainless steel inserts. Die castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy.

Enclosure: Door frames are die-cast, hinged and latched for toolless entry. Lens is ⅛" clear tempered glass, sealed with one piece silicone gasket.

Electrical: 23.6 W LED luminaire, 26 system watts, -30° C start temperature. Integral 120 V through 277 V electronic LED driver, 0-10 V dimming.
Standard LED color temperature is 4000K with a >80 CRI. Available in 3000K (>80 CRI); add suffix K3 to order.
Note: Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

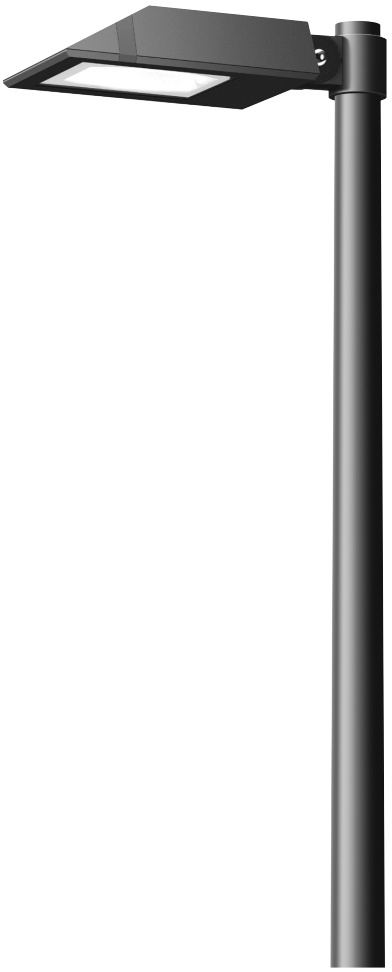
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. These luminaires are available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

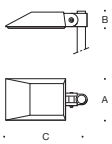
UL listed for US and Canadian Standards, suitable for wet locations, Protection class IP66.

Weight: 18.5 lbs.

EPA (Effective projection area): 0.65 sq. ft.

Luminaire Lumens: 3195





Single pole-top luminaires

	Lamp	LEED	A	B	C
77939	23.6 W LED	LZ-1	11½	4¼	23⅞

Recommended for use with 14' to 25' poles.

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 FAX (805) 566-9474 www.bega-us.com

Type:
BEGA Product:
Project:
Modified:

Application
LED light building element luminares with symmetric light distribution. Light building elements are luminous design features for public areas. They are ideally suited for delineating and structuring interior and exterior spaces such as landscape areas, plazas, building entrances and atria.

Materials
Luminaire housing and posts constructed of die-cast and extruded marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy
Clear safety glass
Reflector made of pure anodized aluminum
High temperature silicone gasket
Silicone applied robotically to casting, plasma treated for increased adhesion
Mechanically captive stainless steel fasteners
Anchorage unite made of galvanized steel

NRTL listed to North American Standards, suitable for wet locations
Protection class IP 65
Weight: 127.9 lbs.

EPA (Effective projection area): 12.27 sq. ft.

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-30° C
LED module wattage	39.5 W
System wattage	44.0 W
Controllability	0-10V dimmable
Color rendering index	Ra > 80
Luminaire lumens	2,595 lumens (4000K)
Lifetime at Ta = 15° C	> 500,000 h (L70)
Lifetime at Ta = 35° C	238,000 h (L70)

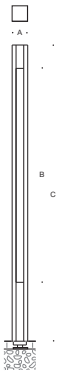
LED color temperature

4000K - Product number + **K4**
3500K - Product number + **K35**
3000K - Product number + **K3**
2700K - Product number + **K27**

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors Black (BLK) White (WHT) RAL:
Bronze (BRZ) Silver (SLV) CUS:



Light building element · symmetric

	LED	A	B	C	Anchorage
84 065	39.5 W	8 5/8 x 8 5/8	128	177	**79 801**

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

BEGA LED system bollard - luminaire head
with shielded light - 180°

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Enclosure: Housing constructed of die-cast aluminum. Die-castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy. Glass diffuser, clear. Pure anodized aluminum reflector system with silver painted conical reflector. Fully gasketed for weather tight operation using molded silicone gasket.

Installation: BEGA LED system bollards are designed for easy attachment to system bollard tubes using an interlocking stainless steel mechanism and stainless steel set screw threaded into stainless steel insert. An accompanying bollard tube must be selected for proper installation, see below chart for compatible tube options.

Electrical: 6.0W LED luminaire, 10 total system watts, -30°C start temperature. Integral 120V through 277V electronic LED driver, 0-10V dimming. LED module(s) are available from factory for easy replacement. Standard LED color temperature is 3000K with a >90 CRI. Available in 4000K (>90 CRI); add suffix K4 to order.
Note: LEDs supplied with luminaire. Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

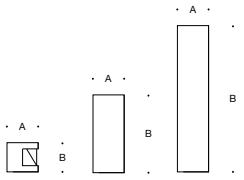
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

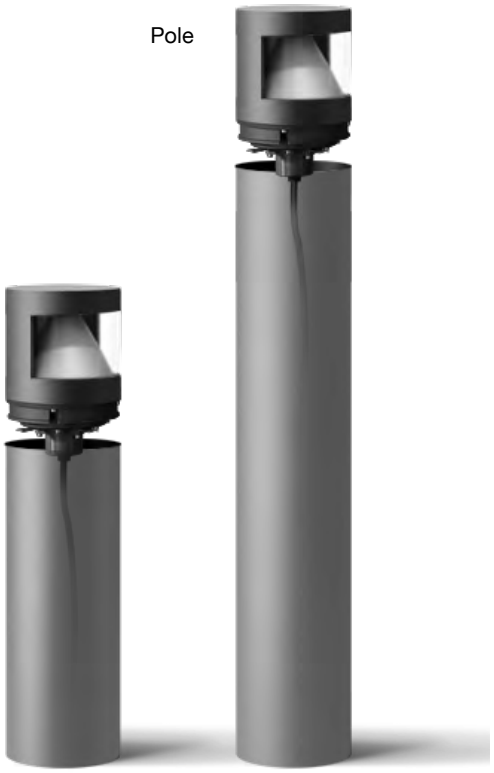
CSA certified to U.S. and Canadian standards, suitable for wet locations. Protection class IP65

Weight: 5.3 lbs.

Luminaire Lumens: 335

Pole





Bollard heads · **shielded with reflector · 180°**			
	Lamp	A	B
99 853	6.0W LED	5 1/2	5 1/2

Bollard tubes for luminaire heights **19 3/4 · 21 3/4**			
	A	B	Anch. unit
99 614	5 1/2	14 1/4	**79 824**

Bollard tubes for luminaire heights **31 1/2 · 39 1/4**			
	A	B	Anch. unit
99 620	5 1/2	26	**79 824**

BEGA-US 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 FAX (805) 566-9474 www.bega-us.com

BEGA LED system bollard - luminaire head
with shielded light - 360°

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Enclosure: Housing constructed of die-cast aluminum. Die-castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy. Glass diffuser, clear. Pure anodized aluminum reflector system with silver painted conical reflector. Fully gasketed for weather tight operation using molded silicone gasket.

Installation: BEGA LED system bollards are designed for easy attachment to system bollard tubes using an interlocking stainless steel mechanism and stainless steel set screw threaded into stainless steel insert. An accompanying bollard tube must be selected for proper installation, see below chart for compatible tube options.

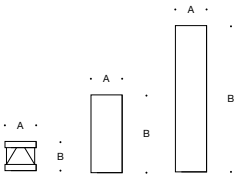
Electrical: 6.0W LED luminaire, 10 total system watts, -30°C start temperature. Integral 120V through 277V electronic LED driver, 0-10V dimming. LED module(s) are available from factory for easy replacement. Standard LED color temperature is 3000K with a >90 CRI. Available in 4000K (>90 CRI); add suffix K4 to order.
Note: LEDs supplied with luminaire. Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

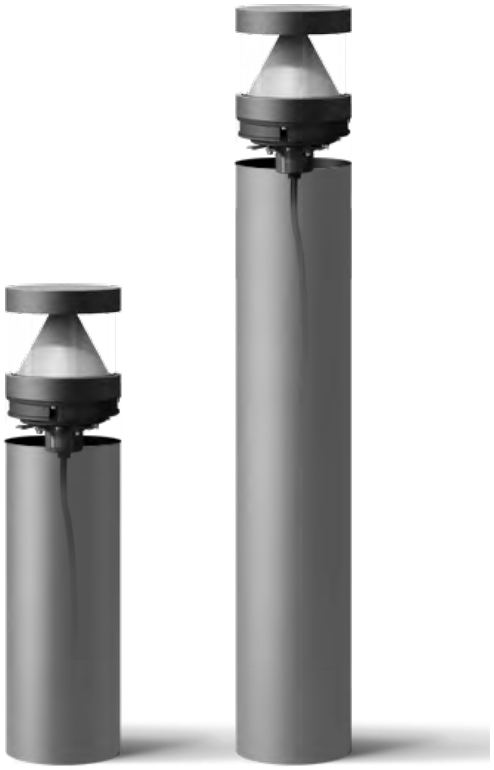
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

CSA certified to U.S. and Canadian standards, suitable for wet locations. Protection class IP65

Weight: 5.3 lbs.

Luminaire Lumens: 664





Bollard heads · **shielded with reflector · 360°**

	Lamp	A	B
99 852	6.0W LED	5½	5½

Bollard tubes for luminaire heights **19¾ · 21¾**

	A	B	Anch. unit
99 614	5½	14¼	**79 824**

Bollard tubes for luminaire heights **31½ · 39¼**

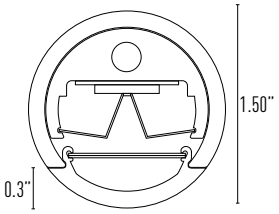
	A	B	Anch. unit
99 620	5½	26	**79 824**

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 FAX (805) 566-9474 www.bega-us.com

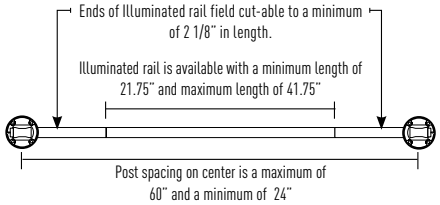
IVR15-RPS

1.5" O.D. Solid State Illuminated Rail
Remote Power Supply

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

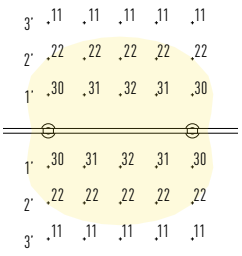


90° APERTURE

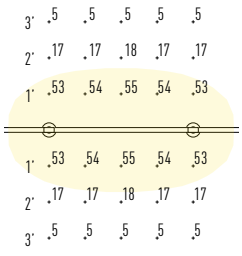


PHOTOMETRIC DATA

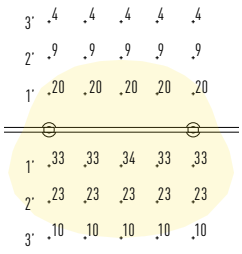
- LED: 4.6W High Output
- CCT: 3500K
- Illuminated Rail Length: 41"
- Rail Height: 36"
- Post Spacing: 48"



60° Flood



35° Narrow



30° Asymmetrical

CONSTRUCTION

Internal Rail Construction: Heavy duty extruded 6061-T6 Aluminum Alloy.
External Rail Jacket: Available in 304 or 316 stainless steel. Consult factory for custom powder coat finishes (AAMA 2604).

LED LIGHT SOURCE

Closely packed array of small LEDs allow for smooth seamless illumination with immediate overlap to avoid pixilation and provide a continuous flow of light. Color temperatures options include 2700K, 3000K, 3500K or 4000K.

- 85 CRI
- 50,000 hours of average rated life at 70% output
- LED components are easily accessible to allow for easy maintenance

LED LIGHT ENGINE (PER FOOT)

- System Power Consumption: 4.6W
- Cool White 4000K: 219 lm
- Neutral White 3500K: 207 lm
- Warm White 3000K: 202 lm
- Warm White 2700K: 194 lm

OPTICAL SYSTEM

Innovative optical system includes integral reflector and light shaping diffuser. 92% Transmission efficiency provides precise shaping, control and distribution of light. High-impact acrylic lens is secured with (2) countersunk flush screws, (1) at each end. Distributions include flood, narrow and asymmetric.

REMOTE MOUNTING POWER SUPPLY

Configured per project requirements. Supplies 24V electronically stabilized power to LED's. U.L. Class 2 output for safe operation. Housed to NEMA rated enclosures. Intense Lighting provides shop drawings and specification to satisfy Architect and Electrical Contractor.

MOUNTING / INSTALLATION

Each rail support is secured to the swivel mount on specified mounting system. Wall, post or embedded mount is available. See mounting submittal sheets for detailed information.

EMERGENCY

Remote emergency inverter available. Can be remote up to 1000 ft. available. See IB-IIS specification sheet.

WARRANTY / LISTINGS

- 5-Year Intense LED Limited Warranty (LED & Power Supply Only)
- ETL Wet Location Listed
- IDA Approved
- ADA Compliant

AWARD

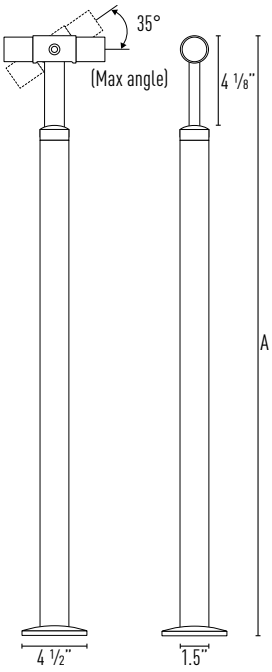
- 2013 Next Generation Luminaires - "Recognized Winner"

INTENSE LIGHTING | 3340 E La Palma Ave, Anaheim, CA 92806 | **tel** 714 630-9877 | **fax** 714 630-9883

IVR15-RPS

1.5" O.D. Remote Post Mount Assembly

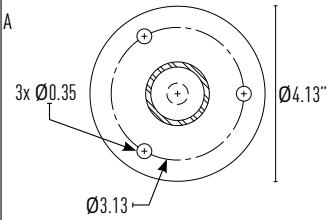
JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



DIMENSIONS

	Guardrail	Handrail
A	42"	36"

BASE SPECIFICATION



CONSTRUCTION

Post mount assembly is available in No.4 polished 304 stainless steel. Consult factory for custom powder coat finishes (AAMA 2604).

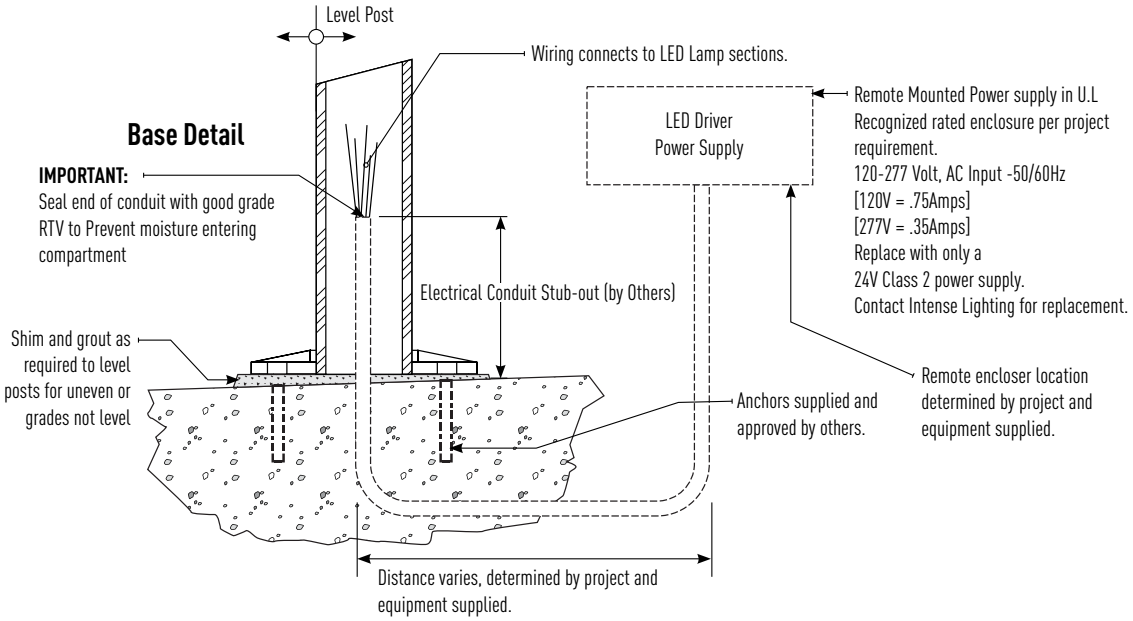
MOUNTING / INSTALLATION

Post are to be spaced at a maximum of 60" and minimum of 24" on centers. Post mount is to be surface mounted to concrete utilizing 5/16" anchor bolts (supplied by others). Anchoring means and size must be determined by local codes. Not to be supplied or engineered by Intense Lighting. See post mount installation chart for more information. Anchorage template available by request.

FITTINGS

Consult factory for standard fittings and epoxy weld adhesive.

Post Mount Installation Detail



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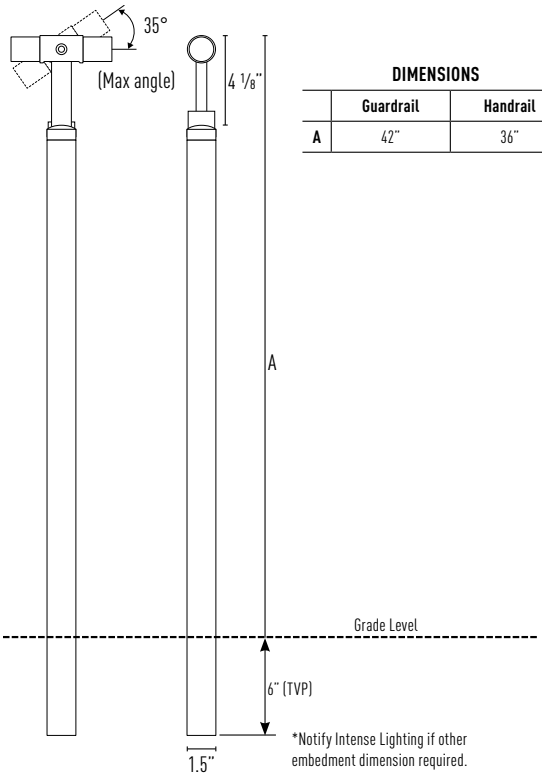
IVR15-RPS

1.5" O.D. Remote Post Embedded Assembly

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



DIMENSIONS

	Guardrail	Handrail
A	42"	36"

CONSTRUCTION

Embedded mount assembly is available in No.4 polished 304 stainless steel. Consult factory for custom powdercoat finishes (AAMA 2604).

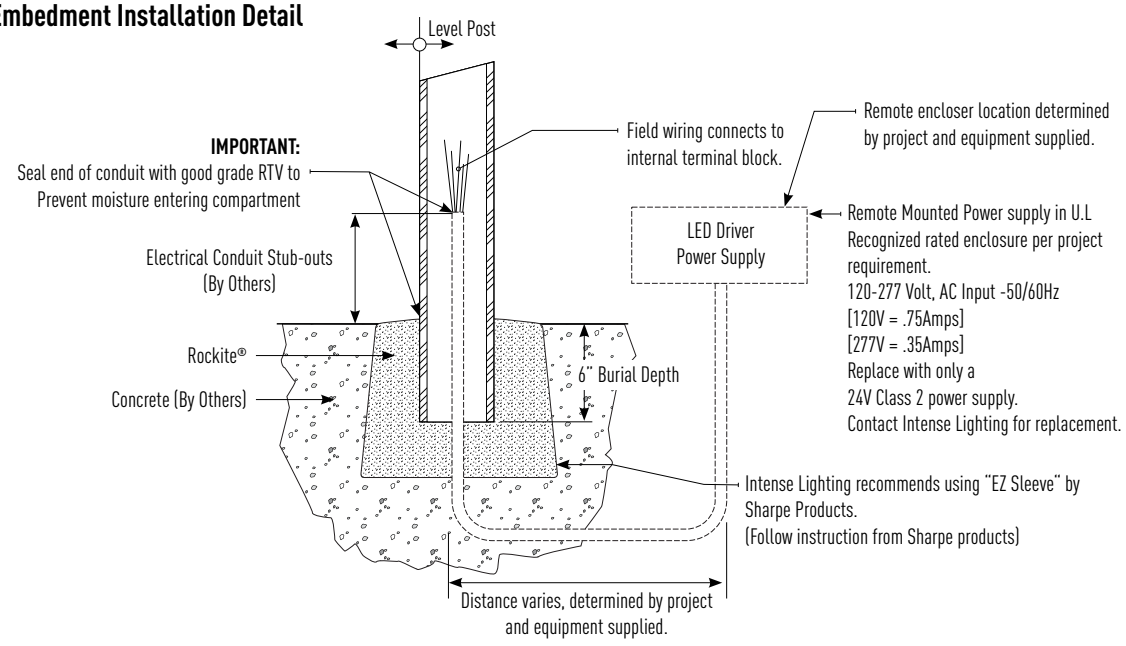
MOUNTING / INSTALLATION

Post are to be spaced at a maximum of 60" and minimum of 24" on centers. Embedded mount post are set into place using Rockite® or Kwixset® anchor cement. A minimum of 6" post must be embedded into concrete to structurally secure post. Anchoring means and size must be determined by local codes. Not to be supplied or engineered by Intense Lighting. See Embedded Mount Installation chart for more information.

FITTINGS

Consult factory for standard fittings and epoxy weld adhesive.

Embedment Installation Detail



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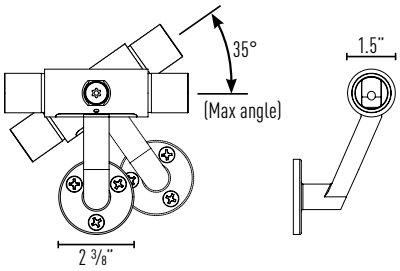
IVR15-RPS

1.5" O.D. Remote Post Wall Mount Assembly

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



CONSTRUCTION

Wall mount assembly is available in No.4 polished 304 stainless steel. Consult factory for custom powdercoat finishes.

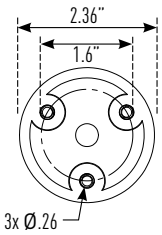
MOUNTING / INSTALLATION

Post are to be spaced at a maximum of 60" and minimum of 24" on centers. Wall mount assembly is to be mounted to concrete wall utilizing 1/4" anchor bolts (supplied by others). Anchoring means and size must be determined by local codes. Not to be supplied or engineered by Intense Lighting. See Wall Mount Installation chart for more information. Anchorage template available by request.

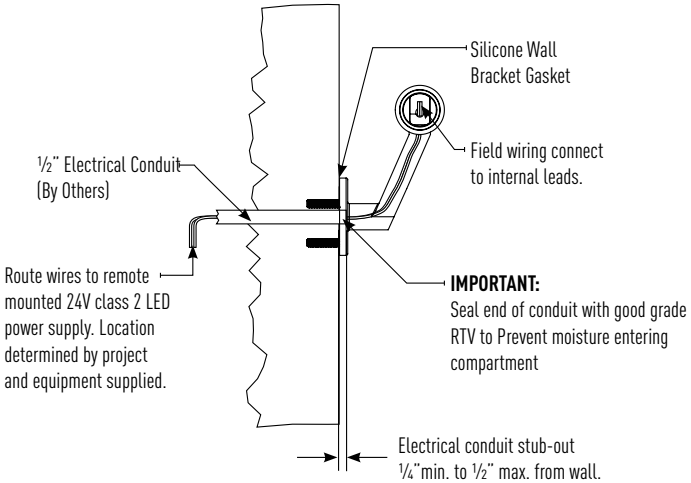
FITTINGS

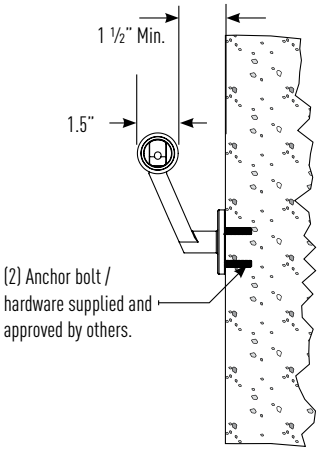
Consult factory for standard fittings and epoxy weld adhesive.

WALL BRACKET SPECIFICATION



Wall Mounted Installation Detail





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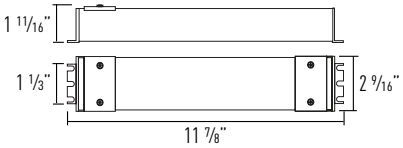
IVR15-RPS

Remote Power Supply - Wet Location No Enclosure Required

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



IB-OT96 - 96W 24V Damp Location
IB-OT96-DIM - 96W 24V Damp Location 0-10V Dimming

FEATURES
- Protected against open circuit, short circuit, overload and overheating issues
- Universal 120-277V input
- UL Wet location listed and FCC compliant
- Built in wiring compartments
- Integrated 0-10V dimming available

MAX RUN LENGTH (POST ON 4' CENTER)
- High Output (HO) - 20'

SPECIFICATIONS
- Input: 100-240VAC, 1.5-0.75A 277VAC / 0.47A, 47-63Hz
- Output: 96W 24V / 4A
- Ambient Temperature Range: -22˚F to 158˚F (-30˚C to 70˚C)
- Weight: 2 lbs (.09 kg)
- Wiring: 18 AWG
- Classification: Class 2
- Protection Rating: IP66
- UL/cUL Recognized for damp location

Maximum Mounting Distance (ft) to LED Input (at full load)

Power Supply	22 AWG	18 AWG	14 AWG	12 AWG
IB-OT96	7'	18'	46'	71'
IB-ADV24V-347	7'	18'	46'	71'

Remote Wiring Limitation for Constant Voltage Power Supplies Due to EMI
All Constant Current power supplies are limited to **32ft maximum** remote mounting distance for EMI compliance (except NAED 51524 OT3/120-240/350 – 50ft).

Although it is possible to exceed the EMI limited remote mounting distance, it is the responsibility of the installer and/or end user to take precautions to prevent and/or test the effects of EMI on the installation. Additional EMC/EMI filters may be required on the output side of the power supply for compliance of installations above the limits given in Table 1.

V-RAIL L/M-050818 P-5
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IVR15-RPS

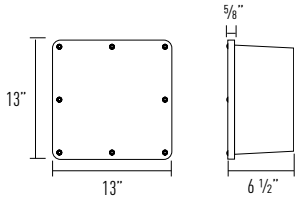
Remote Power Supply - Multiple Output Wet Location Enclosure

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

Nema 4x UL Listed Outdoor Rated PVC Boxes

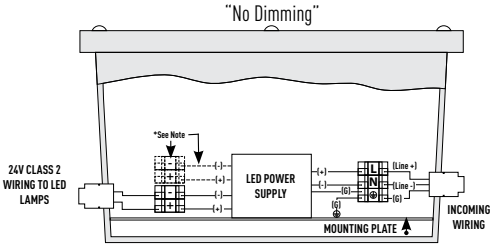
Non-Corroding, Non-Conducting, Fire Resistant, Concrete Tight

Suitable for Surface Mount and Recessed Mount



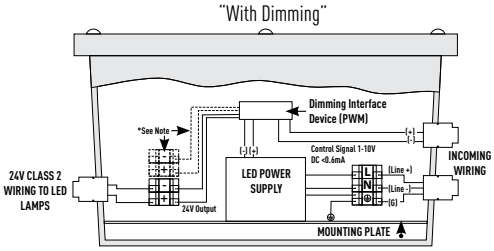
LED Remote Power Supply

"No Dimming"



LED Remote Power Supply

"With Dimming"



Wire gauge to be determined per project. Voltage drop occurs with distance. Any change in wire length requires re-engineering.

*Notes: Dash lines represent additional outputs when supplied per project.

All components inside enclosure are supplied by Intense lighting.

IVR-RPS-1-0T96 - (1) 96W 120/277V (1) 24V Outputs
IVR-RPS-2-0T96 - (2) 96W 120/277V (2) 24V Outputs
IVR-RPS-3-0T96 - (3) 96W 120/277V (3) 24V Outputs

FEATURES

- Protected against open circuit, short circuit, overload and overheating issues
- Universal 120-277V input
- Suitable for damp and wet locations
- Easy connectivity to terminal blocks
- Integrated 0-10V dimming available

SPECIFICATIONS

- Input Power: 108-305VAC, 50/60 Hz, .91A @ 120VAC
- Output Power: 96W 24V DC
- Ambient Temperature Range: -22˚F to 158˚F (-30˚C to 70˚C)
- Classification: Class 2
- Protection Rating: IP66

IVR-RPS-1-ADV24V-347 - (1) 96W 347V (1) 24V Outputs
IVR-RPS-2-ADV24V-347 - (2) 96W 347V (2) 24V Outputs
IVR-RPS-3-ADV24V-347 - (3) 96W 347V (3) 24V Outputs

FEATURES

- Protected against open circuit, short circuit, overload and overheating issues
- Ideal for projects in USA with 480V input
- Ideal for projects in Canada with 347V input

SPECIFICATIONS

- Input Power: 347-480VAC,
- Output Power: 100W 24V DC
- Ambient Temperature Range: -40˚C to 65˚C
- Classification: Class 2
- Protection Rating: IP66

V-RAIL L/M-050818 P-6

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intense LIGHTING | a LEVITON company

IVR15-RPS

1.5" O.D. V-Rail Remote Power Supply
Specification Guide

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

V-Rail Part Number (**Example:** IVR15-RPS-ST-W-HO27-60S
(Specify Quantity By Foot)

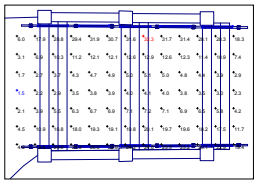
A: Family	B: Finish	C: Mounting/Height	D: LED Output	E: CCT	F: Light Distribution	G: Electrical	H: Options
IVR15-RPS	**-ST** (304 Stainless Steel)[1] **-C** (Custom)[2]	**-W** (Wall Mount) **-P36** (36" Post Mount) **-P42** (42" Post Mount) **-E36** (36" Embedded Mount) **-E42** (42"Embedded Mount)	**-HO** (High Output 4.6W) **-NL** (No LED - Rail Only)[3]	**27** (2700K) **30** (3000K) **35** (3500K) **40** (4000K)	**-60S** (60° Flood) **-35S** (35° Narrow) **-30AS** (30° Asymmetric)	blank (24V Input)	**-I** (Infill)[2]

Notes:
1. 316 Stainless steel available by special order
2. Special order, consult factory
3. No LED (rail only). Please omit sections E, F, and G

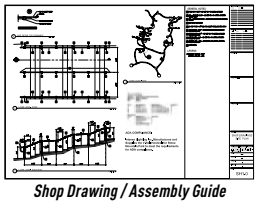
Specification and Delivery Process

Architectural drawings or detailed elevation drawings are required for a V-Rail quotation. A photometric layout will be provided if requested. Once an order is placed, Intense Lighting will provide detailed shop drawings for approval.

V-Rail will be delivered to the job site ready for installation. A detailed assembly drawing will be provided along with dimensions and locations for remote power supplies. All products included will be labeled clearly to match the assembly drawing. Certain tools and equipment will be required for the assembly of V-Rail. A detailed list of tools can be found in the V-Rail Installation Guide. Installation guide available upon request, consult factory.



Photometric Layout



Shop Drawing / Assembly Guide

Completed Project

Notes:

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intense LIGHTING | a LEVITON company

Type:
BEGA Product:
Project:
Modified:

Application
LED wall mounted luminaires with directed light designed to be mounted at various heights for general purpose illumination or glare free illumination when below eye level.

Materials
Luminaire housing constructed of die-cast marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Matte safety glass
Silicone applied robotically to casting, plasma treated for increased adhesion
High temperature silicone gasket
Mechanically captive stainless steel fasteners

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 3.6lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-40° C
LED module wattage	12.3W
System wattage	15.0W
Controllability	0-10V, TRIAC, and ELV dimmable
Color rendering index	Ra>80
Luminaire lumens	1,077 lumens (3000K)
Lifetime at Ta=15° C	>500,000 h (L70)
Lifetime at Ta=45° C	108,000 h (L70)

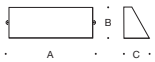
LED color temperature

4000K - Product number + **K4**
3500K - Product number + **K35**
3000K - Product number + **K3**
2700K - Product number + **K27**

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS:



LED wall luminaires · directed

		LED	A	B	C
24374	ADA	12.3W	11⅞	4⅜	3⅜

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805)684-0533 info@bega-us.com